

MARE BASALTS IN SINUS AESTUUM AND SINUS MEDII. J. B. Sharp, N. Gilbert, and R. A. De Hon, Department of Physical Science, University of Arkansas at Monticello, Monticello, AR. 71655.

An isopach map (Fig. 1) of the mare basalts in Sinus Aestuum and Sinus Medii (16°N to 6°S; 16°W to 4°E) is constructed from measurements of the exposed external rim height of partially buried craters (1). Earth-based and Orbiter IV photographs were used for crater selection and elevations were derived from LAC topographic sheets. The total volume of basalts under study is approximately 41,000 km<sup>3</sup> covering an area of 189,000 km<sup>2</sup>.

Sinus Aestuum (16°N to 6°S; 16°W to 3°W), south of Mare Imbrium and west of Mare Vaporum and Sinus Medii, is a very old, irregularly shaped basin approximately 530 km N-S by 275 km E-W with a deeply flooded northern region between 7°N to 12°N; 8°W to 16°W. The basin configuration in the northern region of Sinus Aestuum has been greatly distorted by the superposition of the younger Imbrium basin as evident by the southward extent of the Imbrium rim. The pre-Imbrian basin is cut by the Imbrium radial structure and blanketed by Imbrium ejecta which is overlain by the younger mare material. The deeply flooded northern region of Sinus Aestuum is presumably the site of an impact. A mascon, producing a gravity anomaly of 40 to 60 milligals (2), exists in association with this increase in thickness. Craters used for depth measurements in the region of the mascon are almost totally obscured. Consequently, accurate depth measurements in this area are limited. However, the crater Stadium located 10°N; 14°W on the western edge of the mascon provides an indication of the probable thickness of the immediate area.

Widespread shallow flooding of the southern region of Sinus Aestuum is separated from the deeply flooded northern region by a mare ridge complex. Shallow flooding is evident by the relatively large number of partially buried craters which are preserved. These partially buried craters exhibit significant degradation leaving some crater rims existing only as incomplete arcs. Severely degraded craters were used for depth measurements in areas where no other data is available. The error involved is unknown, but the data seems sufficient to reflect the general thickness trends.

Data compiled from partially buried craters in Sinus Aestuum indicated a thickness of approximately 1250 m in the deeply flooded northern region, but an overall average thickness of only 192.5 m. Total volume of mare basalts in Sinus Aestuum

## SINUS AESTUUM AND SINUS MEDII

Sharp, J.B., et al.

is calculated to be approximately  $32,000 \text{ km}^3$  covering an area of  $167,678 \text{ km}^2$ .

Sinus Medii ( $4^\circ\text{N}$  to  $2^\circ\text{S}$ ;  $3^\circ\text{W}$  to  $4^\circ\text{E}$ ) is a very small irregular basin which is, like Sinus Aestuum, a pre-Imbrian structure. The basin and interior craters have been significantly degraded by ejecta bombardment from surrounding impact structures prior to mare emplacement. Evidence of crater degradation is provided by the incomplete arc of the crater Oppolzer located on the south central edge of Medii. A small mascon, with center at approximately  $2^\circ\text{N}$ ;  $1^\circ\text{E}$ , correlates with the thickness increase in the central region of Medii. Flooding in Sinus Medii is of considerable extent with the greatest thickness located in the central interior. Buried craters inside the Medii basin are almost totally obscured by the mare basalts; however, the use of earth-based photographs with a wide range of sun angles revealed craters that were otherwise obscured.

Buried craters in Sinus Medii suggest that the basin formation is due to a series of overlapping impact structures with the deepest point calculated to be approximately 1233 m, with an overall average thickness of 429 m. Total volume of basalts in Sinus Medii is approximately  $9,000 \text{ km}^3$  covering an area of  $21,471 \text{ km}^2$ .

## References

1. De Hon, R.A., and Waskom, J.D. (1976) Proc. Lunar Sci. Conf. 7th, p. 2729-2746.
2. Sjogren, W.L. (1974) Proc. Lunar Sci. Conf. 5th. V. 1, Plate 1.

## SINUS AESTUUM AND SINUS MEDII

Sharp, J.B., et al.

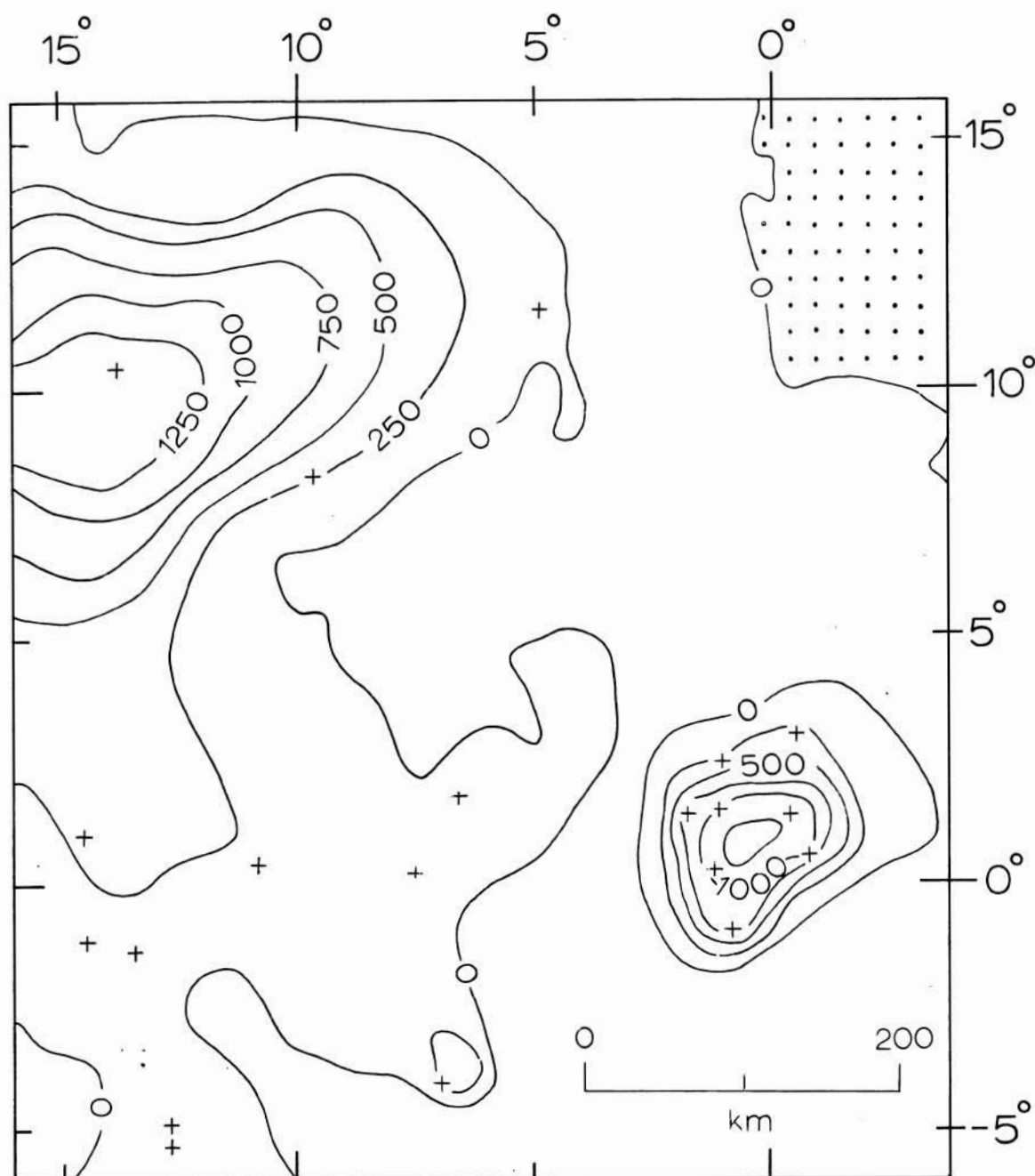


Figure 1. Isopach map of mare filling material in Sinus Aestuum and Sinus Medii. Isopach interval is 250 m.